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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,137	02/11/2004	Sergei V. Govorkov	LMPY-20220 [354/U]	5445

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EXAMINER	
AL NAZER, LEITH A	

ART UNIT	PAPER NUMBER
2821	

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/776,137	GOVORKOV ET AL.	
	Examiner	Art Unit	
	Leith A. Al-Nazer	2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 13-19* is/are rejected.

7)☒ Claim(s) *10-12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12 August 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "210" has been used to designate both a main electrode and a photodetector (see figure 2). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: reference number 614, reference number 916, and reference number 1012. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures

appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-6 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,313,487 to Fujikawa et al.

With respect to claim 1, Fujikawa teaches a method of generating an optical pulse in a gas discharge laser, comprising applying a main discharge voltage to a pair of main discharge electrodes (1 and 2) in a discharge chamber of the laser in order to charge the pair of main discharge electrodes; applying a trigger ionization voltage to an ionization element (5) in the discharge chamber, subsequent to the charging of the pair of main electrodes; and discharging the main discharge voltage between the main

discharge electrodes in response to the applying of the trigger ionization voltage (column 1, lines 5-40; column 12, line 38 – column 13, line 10).

With respect to claim 2, Fujikawa teaches timing the application of the trigger ionization voltage to occur when a maximum voltage charge exists on the pair of main discharge electrodes (column 12, line 38 – column 13, line 10).

With respect to claim 3, Fujikawa teaches applying a trigger ionization voltage to an ionization element including applying the trigger ionization voltage to an ionization element selected from the group consisting of ionization electrodes, corona rods, and ionization pins (column 1 line 55 – column 2, line 10).

With respect to claim 4, Fujikawa teaches using an ionization circuit to apply the trigger ionization voltage, the ionization circuit being electrically isolated from a discharge circuit used to apply the main discharge voltage (figure 1).

With respect to claim 5, Fujikawa teaches using an ionization circuit to apply the trigger ionization voltage, the ionization circuit including a high-voltage solid state switch whereby the trigger ionization is applied in response to a closing of the solid state switch (column 1, line 55 – column 2, line 10).

With respect to claim 6, Fujikawa teaches an optical pulse being generated in the discharge chamber when the charged pair of main electrodes discharges (column 1, lines 10-40).

With respect to claim 14, Fujikawa teaches a gas discharge laser system comprising a resonator including therein a discharge chamber filled with a gas mixture and containing a pair of main electrodes (1 and 2) connected to a pulser circuit for

charging the pair of main electrodes with a discharge voltage; and an ionization circuit including an ionization element (5) in the discharge chamber, the ionization circuit (15) being capable of supplying a trigger ionization voltage to the ionization element (5) subsequent to the charging of the pair of main electrodes in order to provide sufficient ionization of a gas mixture in the discharge chamber such that the main electrodes discharge in the gas mixture (column 1, lines 5-40; column 12, line 38 – column 13, line 10).

5. Claims 1-3, 5, 6, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application Publication No. 2002/0012376 to Das et al.

With respect to claims 1-3, Das teaches a method of generating an optical pulse in a gas discharge laser, comprising applying a main discharge voltage to a pair of main discharge electrodes (18 and 20 in figures 1-3) in a discharge chamber of the laser in order to charge the pair of main discharge electrodes; applying a trigger ionization voltage to an ionization element (52) in the discharge chamber, subsequent to the charging of the pair of main electrodes; and discharging the main discharge voltage between the main discharge electrodes in response to the applying of the trigger ionization voltage (paragraph 0025).

With respect to claim 5, Das teaches using an ionization circuit to apply the trigger ionization voltage, the ionization circuit including a high-voltage solid state switch (8 and 10 in figure 5) whereby the trigger ionization is applied in response to a closing of the solid state switch.

With respect to claim 6, Das teaches an optical pulse being generated in the discharge chamber when the charged pair of main electrodes discharges (paragraph 0025).

With respect to claim 14, Das teaches a gas discharge laser system comprising a resonator including therein a discharge chamber filled with a gas mixture and containing a pair of main electrodes (18 and 20) connected to a pulser circuit for charging the pair of main electrodes with a discharge voltage (paragraph 0003); and an ionization circuit including an ionization element (52) in the discharge chamber, the ionization circuit being capable of supplying a trigger ionization voltage to the ionization element subsequent to the charging of the pair of main electrodes in order to provide sufficient ionization of a gas mixture in the discharge chamber such that the main electrodes discharge in the gas mixture (paragraph 0025).

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 1-3, 5-9, and 13-19 are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent No. 6,549,551 to Ness et al.

With respect to claims 1 and 3, Ness teaches a method of generating an optical pulse in a gas discharge laser, comprising applying a main discharge voltage to a pair of main discharge electrodes (6A and 6B) in a discharge chamber of the laser in order

to charge the pair of main discharge electrodes; applying a trigger ionization voltage to an ionization element (56) in the discharge chamber, subsequent to the charging of the pair of main electrodes; and discharging the main discharge voltage between the main discharge electrodes in response to the applying of the trigger ionization voltage (column 2, lines 3-25).

With respect to claim 2, Ness teaches timing the application of the trigger ionization voltage to occur when a maximum voltage charge exists on the pair of main discharge electrodes (column 2, lines 16-21).

With respect to claim 5, Ness teaches using an ionization circuit to apply the trigger ionization voltage, the ionization circuit including a high-voltage solid state switch whereby the trigger ionization is applied in response to a closing of the solid state switch (column 13, lines 6-16).

With respect to claim 6, Ness teaches an optical pulse being generated in the discharge chamber when the charged pair of main electrodes discharges (column 2, lines 16-21).

With respect to claim 7, Ness teaches receiving an optical pulse from an oscillator chamber (column 2, lines 38-50).

With respect to claim 8, Ness teaches amplifying the optical pulse in the discharge chamber when the charged pair of main electrodes discharges (column 2, lines 38-50).

With respect to claim 9, Ness teaches timing the application of the trigger ionization voltage such that the discharge of the charged pair of main discharge

electrodes substantially coincides with the receiving of the optical pulse (column 5, line 40 – column 7, line 40).

With respect to claim 13, Ness teaches applying a trigger ionization voltage to the ionization element including receiving a portion of an optical pulse from an oscillator chamber, the optical pulse serving to provide sufficient ionization of the energized gas mixture such that the charged pair of main electrodes discharges in the discharge chamber (figures 13 and 14; column 2, lines 1-50).

With respect to claim 14, Ness teaches a gas discharge laser system comprising a resonator including therein a discharge chamber (8) filled with a gas mixture and containing a pair of main electrodes (6) connected to a pulser circuit (2) for charging the pair of main electrodes with a discharge voltage; and an ionization circuit including an ionization element (56) in the discharge chamber, the ionization circuit being capable of supplying a trigger ionization voltage to the ionization element subsequent to the charging of the pair of main electrodes in order to provide sufficient ionization of a gas mixture in the discharge chamber such that the main electrodes discharge in the gas mixture (column 2, lines 3-35).

With respect to claims 15 and 17, Ness teaches an excimer or molecular fluorine laser system comprising a master oscillator including therein a first discharge chamber (figure 5) filled with a first gas mixture, the first discharge chamber containing first main discharge electrodes connected to a first discharge circuit for charging the first main electrodes; a power amplifier (figure 4) including therein a second discharge chamber filled with a second gas mixture, the second discharge chamber containing second main

discharge electrodes connected to a second discharge circuit for charging the second main electrodes; a first ionization circuit including a first ionization element disposed in the first discharge chamber, the first ionization circuit capable of applying a first trigger ionization voltage to the first ionization element subsequent to the charging of the first main electrodes in order to provide sufficient ionization of the first gas mixture such that the first main electrodes discharge in the gas mixture and generate an optical pulse in the first discharge chamber (column 13, lines 1-17); a second ionization circuit including a second ionization element in the second discharge chamber, the second ionization circuit being capable of applying a second trigger ionization voltage to the second ionization element subsequent to the charging of the second main electrodes in order to provide sufficient ionization of the second gas mixture such that the second main electrodes discharge in the gas mixture and amplify the optical pulse generated by, and received from, the master oscillator (column 13, lines 1-17); and an electronic control module (figure 11; "Pulse Power" element in figures 13 and 14) in communication with the first and second ionization circuits, the electronic control module capable of supplying a signal to each of the first and second ionization circuits in order to control a relative timing of the application of the first and second trigger ionization voltages.

With respect to claim 16, Ness teaches a common pulser circuit in communication with the master oscillator and power amplifier, the common pulser circuit including the first and second discharge circuits (figure 11; "Pulse Power" element in figures 13 and 14).

With respect to claim 18, Ness teaches an excimer of molecular fluorine laser system comprising a master oscillator (figure 5) including therein a first discharge chamber filled with a first gas mixture, the first discharge chamber containing first main discharge electrodes connected to a first discharge circuit for charging the first main discharge electrodes to energize the first gas mixture and generate an optical pulse therein (figure 5; column 7, line 55 – column 9, line 45); a power amplifier (figure 4; column 7, line 55 – column 8, line 45) including therein a second discharge chamber filled with a second gas mixture, the second discharge chamber containing second main discharge electrodes connected to a second discharge circuit for charging the second main discharge electrodes, the second discharge chamber receiving a portion of the optical pulse in order to trigger sufficient ionization in the second gas mixture subsequent to the charging of the second main discharge electrodes whereby the energized second gas mixture receives and amplifies the optical pulse (figures 13 and 14; column 4, line 45 – column 5, line 30).

With respect to claim 19, Ness teaches an optical delay line in a path of the optical pulse between the master oscillator and power amplifier such that the portion of the optical pulse is transmitted directly to the power amplifier and the remainder of the optical pulse encounters a delay, such that the electrical discharge in the gas mixture is fully developed when the remainder of the optical pulse reaches the power amplifier (figure 3c; column 7, lines 10-40).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2002/0012376 to Das et al. in view of U.S. Patent No. 5,313,487 to Fujikawa et al.

Claim 4 requires using an ionization circuit to apply the trigger ionization voltage, the ionization circuit being electrically isolated from a discharge circuit used to apply the main discharge voltage. Fujikawa shows an ionization circuit (15) being isolated from a discharge circuit (14) used to apply the main discharge voltage (figure 1). At the time of the invention, it would have been obvious to one having ordinary skill in the art to utilize an electrically isolated ionization circuit. The motivation for doing so would have been to avoid noise or interference between the ionization circuit and the discharge circuit.

11. Claims 4 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,549,551 to Ness et al. in view of U.S. Patent No. 5,313,487 to Fujikawa et al.

Claim 4 requires using an ionization circuit to apply the trigger ionization voltage, the ionization circuit being electrically isolated from a discharge circuit used to apply the main discharge voltage. Fujikawa shows an ionization circuit (15) being isolated from a discharge circuit (14) used to apply the main discharge voltage (figure 1). At the time of the invention, it would have been obvious to one having ordinary skill in the art to utilize an electrically isolated ionization circuit. The motivation for doing so would have been to avoid noise or interference between the ionization circuit and the discharge circuit.

Allowable Subject Matter

12. Claims 10-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach or suggest one or more of the limitations found in claims 10 and 12. With respect to claim 10, the prior art of record fails to teach or suggest timing the application of the trigger ionization voltage including receiving a

signal from a photodetector for the oscillator chamber, the signal indicating the emission of the optical pulse in the oscillator chamber. With respect to claim 12, the prior art of record fails to teach or suggest timing the application of the trigger ionization voltage including receiving a signal from a pick off loop for the oscillator chamber, the signal indicating the application of a charging voltage to a pre-ionization unit of the oscillator chamber.

Citation of Pertinent References

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patent documents further show the state of the art with respect to gas discharge laser systems:

a. U.S. Patent No. 4,837,773 to Wakata et al.

b. U.S. Patent No. 5,754,579 to Mizoguchi et al.

c. U.S. Patent No. 6,456,643 to Osmanow et al.

d. U.S. Patent No. 6,754,247 to Kakizaki et al.

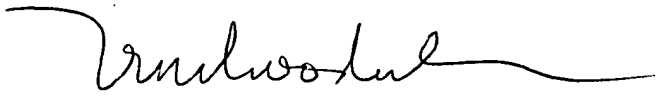
e. U.S. Patent No. 6,771,685 to Yabu et al.

Communication Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leith A. Al-Nazer whose telephone number is 571-272-1938. The examiner can normally be reached on Monday-Friday, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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